PATENT ABSTRACTS OF JAPAN

(11)Publication number :   10-070750

(43)Date of publication of application : 10.03.1998

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(51)Int.Cl.   H04Q   7/14

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(54) INFORMATION RECEIVER

(57)Abstract:

PROBLEM TO BE SOLVED: To surely store important message information over the long period of time by adding identification information for indicating whether or not to perform prescribed reporting at the time of displaying the information corresponding to storage information.

SOLUTION: Corresponding to each message information stored in the message memory 24b of a RAM 24, the identification information for indicating whether or not to perform the prescribed reporting at the time of selectively displaying the message information is stored in a management data memory 24a. When the storage capacity of the message memory 24b becomes full, the message information other than the message information to be protected is eliminated from the message memory 24b in a prescribed order corresponding to the identification information of the management data memory 24a and the message information stored in the message memory 24b is displayed at a display part 29 in a call termination order including the message information to be protected. Thus, whether or not the message information during display is the message information to be stored and held for the long period of time or whether or not it is un-confirmed message information are recognized.
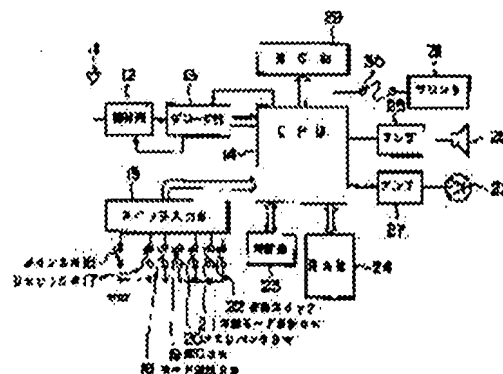
LEGAL STATUS

[Date of request for examination]   13.06.1997

[Date of sending the examiner's decision of
rejection]

[Kind of final disposal of application other than
the examiner's decision of rejection or
application converted registration]

[Date of final disposal for application]

[Patent number]   3159121

[Date of registration]   16.02.2001

[Number of appeal against examiner's
decision of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the selective-calling receiver with a display function used for an individual selective-calling radio communications system.

[0002]

[Description of the Prior Art] In the individual selective-calling radio communications system, it has the memory for memorizing two or more message information, and while displaying the message information received at the time of a call by the display, said memory is made to memorize the received message information, and the selective-calling receiver with a display function which can carry out regeneration in next switch actuation is also used. In this kind of receiver, when memory space becomes full, automatic elimination of the message information memorized by memory for every subsequent arrival is carried out at that old order.

[0003]

[Problem(s) to be Solved by the Invention] However, if it was in the above conventional receivers, as mentioned above, it will merely only be eliminated by the old order of arrival of the mail, and was not able to be made to eliminate in consideration of the significance which each message information has.

[0004] This invention was made in view of the above actual condition, and aims at offering the selective-calling receiver with a display function which can continue at a long period of time and can memorize important message information certainly.

[0005]

[Means for Solving the Problem] This invention makes the identification information of whether to be what that message should protect add and memorize corresponding to each message information memorized. When the memory capacity of memory fills, while eliminating message information other than the message information which should be protected according to the above-mentioned identification information in predetermined sequence It is made to make it display in order of arrival of the mail including the message information from which the message information memorized by memory should be protected.

[0006] By considering as the above configurations, the order of reception including the protected message information can also be checked at the time of the check of the message information which covered the long time and important message information is not only certainly memorizable, but memorized it in memory.

[0007]

[Embodiment of the Invention] With reference to a drawing, 1 operation gestalt of this invention is explained below.

[0008] Drawing 1 shows the circuitry first. 11 is an antenna and the electric wave of the call containing the message received with this antenna 11 is sent to the wireless section 12. This wireless section 12 performs intermittent reception by the drive of the decoder section 13, amplifies a received electric wave, gets over, and is sent out to the decoder section 13. The call classification information that it expresses with the decoder section 13 what the classification of the call added to that the number called with the call detecting signal when it judged whether the called number is in agreement with the recognition number of self and was in agreement was which recognition number of self, or the call number was, and the message information received following on a call number are sent to CPU14. CPU14 performs motion control of other whole circuit according to the signal from the decoder section 13, and the input signal from the switch input section 15, and consists of a ROM which memorized various control programs, a timer, an arithmetic register, etc. The reset switch 17 which directs discharge in the switch input section 15 in the middle of the main switch 16 which controls ON/OFF of a power source, sound emission, or a message indicator, the deletion mode in which elimination of a protected mode or message data which performs message protection of information is performed, The printout of the memorized message information Mode selection, such as print-out mode to perform Activation of the mode selection switch 18 to perform and actuation with each mode The sound-volume switch 22 grade which performs volume control of the activation switch 19 to direct, the memory bank switch 20 which directs sequential presenting of the memorized message information, the print mode selecting switch 21 which chooses the contents of printing at the time of print-out mode, and a ring tone is connected. The signal according to the actuation is sent out to the above CPU 14. CPU14 -- a time check -- it connects with the clock section 23 which operates, and RAM24 which memorizes two or more message data and control data, and while memorizing the received message information to RAM24 with time-of-day data, it is made to report to a loudspeaker 26 through amplifier 25 that the lighting signal was sent out to LED28 through amplifier 27, respectively, and there was a call about a sound emission signal And CPU14 outputs and carries out the printout of the printing data to the printer 31 which is made to output and display indicative datas, such as message information, on the display 29 which consists of liquid crystal display components, and is connected through the external terminal 30.

[0009] When the above-mentioned main switch 16 is made off, current supply stops all circuits other than CPU14, switch input section 15, clock section 23, and RAM24.

[0010] The above-mentioned display 29 serves as a display pattern as shown in drawing 2 . Besides message indicator section 29a which displays message information on a display 29 with alphanumeric, Cana, a hiragana, and the kanji in this drawing Protected mode display object 29b which tells having gone into the protected mode, Deletion mode display object 29c which tells having gone into deletion mode, 29d of print-out mode display objects which tell having gone into print-out mode, Time-of-day adjustment mode display object 29e which tells having gone into time-of-day adjustment mode, 29f of unidentified (un-displaying) display objects which tell that there is message information which there is message information which has not been displayed once yet, therefore has not been checked yet, 29g of protection message indicator objects which tell

that protection message information has the message information currently displayed, 29h of sag display objects which tell that the cell used as a power source is exhausted, Message No and call classification display 29j which display the classification information on No and the call of sound-volume display object 29i which tells in which location the current sound-volume switch 22 is, and the message information currently displayed are arranged. Both the above-mentioned message indicator section 29a, the message No, and call classification display 29j consist of dot matrices, and the display of said 3 alphabetic characters of 12 character x2 line, Message No, and call classification display 29j is attained by message indicator section 29a by the full-width character.

[0011] In the above RAM 24, message memory 24b and the bank counter which are shown in management data memory 24a shown in drawing 3 (A) or drawing 3 (B), a non-displayed flag counter, the Flushing flag register, a mode counter, a print mode counter, a processed flag register, an initial-state flag register, etc. are prepared.

[0012] As shown in drawing 3 (A), management data memory 24a memorizes the management data for managing message information. The protection flag which shows whether management data protects the message information, The non-displayed flag which shows whether the message is yet displayed, The reset flag which shows whether the above-mentioned reset switch 17 which directs a halt of sound emission in the middle of sound emission was operated, The time at the time of the bank No which shows the storage area of the information which shows the classification of a call, and the message information in message memory 24b, and arrival is constituted as 1 set, and two or more sets, for example, 30 sets, of management data are memorized by this management data memory 21a by the LIFO.

[0013] On the other hand, as shown in drawing 3 (B), message memory 24b is made into the error information and the group which show which block of message information had an error in the actually received message information, and is two or more sets, for example, the thing memorized 30 sets, in page management.

[0014] Here, the configuration of the selective-calling signal to which it is received with an antenna 11 and restores in the wireless section 12 is described. For example, the selective-calling signal of the POCSAG method used as international standards serves as a header for taking the synchronization of the bitwise of a preamble from a part for the data division called the batch which carries out one or more piece N individual continuation. This one batch consists of eight frames following a synchronous codeword and it, and one frame consists of two codewords. There are two kinds of codewords, an address (ID-number) codeword and a message codeword, and it consists of both 32 bits.

[0015] An address codeword is a codeword for a call number (address), and a 2 bits function bit and a 11-bit parity bit are added, and it is constituted by the address bit which the 1st bit turns into from 11 bits set as "0", and this. Said function bit is the call classification information added to the call number, can perform four kinds of distinction called a multiple address call by this bit, and has come to be able to perform four sorts of different singing and the different display (notation "A" for it to display by - "D") to one ID.

[0016] On the other hand, it is a codeword for message information and the 1st bit consists of a message bit which consists of 21 bits set as "1", and a 11-bit parity bit, and a message codeword is transmitted after an address codeword, when there is a message.

[0017] Next, actuation of the above-mentioned operation gestalt is explained.

[0018] If a main switch 16 is set to ON, while the actuation signal will be sent to CPU14 from the switch input section 15 and supply of the power source to the wireless section 12, the decoder section 13, amplifier 25, a loudspeaker 26, amplifier 27, LED28, and a display 29 will be started now, the processing shown in drawing 4 by CPU14 is started.

[0019] In drawing 4 , first, as shown in step A01, each circuit is initialized. Here, the contents of a display of a display 29, the timer of the CPU14 interior, the bank counter in RAM24, etc. are initialized. Subsequently, it judges whether it progressed to step A02, the input signal from the switch input section 15 was read, and either a reset switch 17, the mode selection switch 18, the activation switch 19, the memory bank switch 20, the print mode selecting switch 21 and the sound-volume switch 22 were operated. Then, it judges whether there is any arrival of the mail at step A03. When it is judged that there is nothing, it results in step A04 next, and it judges whether the memory bank switch 20 was operated according to the result of the read in of the actuation switch of the above-mentioned step A02. When it is judged that the memory bank switch 20 was not operated here, either, it judges whether next, the mode selection switch 18 was operated at step A05 this time. And when it is judged that the mode selection switch 18 was not operated, either, it returns to the above-mentioned step A02 again. That is, in the state of the usual standby, a time interval is taken suitably, and processing of steps A02-A05 is repeated and performed.

[0020] When judged as those with arrival of the mail at the above-mentioned step A03, next it progresses to step A06, and arrival-of-the-mail processing is performed. It is received by the antenna 11, and this arrival-of-the-mail processing is memorized to RAM24, after getting over in the wireless section 12 and checking that it is not the 2nd data based on the repeat call to which the incoming data decoded in the decoder section 13 and the time by the time check of the clock section 23 in that time were transmitted less than at predetermined time, for example, 60 seconds.

[0021] In this case, when there are classification information on a call mentioned above and a message codeword as an incoming data, the message information which shows a description, and its error information are memorized. Although the message information on an incoming data and its error information are memorized on an empty bank of message memory 24b, the classification information and arrival-of-the-mail time of a call are memorized on the 1st bank with the bank No of message memory 24b which carried out 1-****** [every] shift processing of the incoming data [finishing / the storage to management data memory 24a], and memorized the message.

[0022] And "+1" of the counted value of the non-displayed flag counter which the non-displayed flag "1" reset when a message is displayed by the read-out processing which can come, simultaneously is later mentioned to the non-displayed flag register of the 1st bank is set, and is used for the lighting control which is 29f of unidentified display objects is carried out.

[0023] Moreover, although sequential elimination is carried out by shift processing from an old thing when 30 sets of data are already memorized by management data memory 24a at this time When the data of "1" and the data of "0" are intermingled in a non-displayed flag and each protection flag A non-displayed flag and a protection flag are check ending, the data, i.e., the message information, on "0." And shift processing is performed in the form eliminated in order of the data which are not protected although a protection flag is unidentified to the data which are not protected and a degree, the data,

i.e., the message information, on "0."

[0024] Here, it is specified that it is 20 sets about the number of the message data which can protect a protection flag as "1" among 30 sets of data. When 30 sets of data are already memorized by management data memory 24a and the protection flag "1" is set to 20 of sets of they, shift processing will be carried out in the form which carries out sequential elimination from 10 sets of old remaining things.

[0025] After storage, in order to show the thing to RAM24 which a call was, a loudspeaker 26 is driven through amplifier 25, and singing (sound emission) is started. In this case, singing serves as so-called difference according to the classification information on said call. While performing display processing according to arrival, such as lighting of flashing of LED28, and 29f of unidentified (un-displaying) display objects of a display 29, and a display of the alphabetic character of "better ** with arrival of the mail" in message indicator section 29a, to this and coincidence through amplifier 27, the timer which clocks this display time is started.

[0026] and -- or it displays until a reset switch 17 is operated or between predetermined time, for example, "8" seconds, passes, and a reset switch 17 is operated -- the time check of a timer -- if time amount serves as predetermined "8" seconds and is that the deadline of it is passed, an indication by the display 29 and LED28 will be given off, and this arrival-of-the-mail processing will be ended.

[0027] An incoming data is memorized by RAM24, while arrival-of-the-mail processing is performed as mentioned above and processing of singing and a display is performed. When it is judged that the memory bank switch 20 was operated at step A04 of above-mentioned drawing 3 , in continuing step A07, read-out processing of the incoming data memorized by this RAM24 is carried out.

[0028] By once operating the memory bank switch 20 continuously more than for 2 seconds with the normal mode which displays an incoming data one by one whenever it operates the memory bank switch 20 once, the mode is set up at the time of data read-out by read-out processing, and there is the search data mode on which a non-displayed incoming data is searched and displayed among the incoming datas memorized by RAM24 in it.

[0029] After making the time of processing start the time check of the 2-second timer which clocks the operate time of the memory bank switch 20 in CPU14 first, and the 30-second timer which clocks the display time of data and setting initial value "1" to a bank counter, as the usual mode, according to the counted value of a bank counter, an incoming data is displayed on read-out and its incoming data, i.e., the classification information on a call, and message information is displayed on a display 29 with the information on arrival-of-the-mail time.

, [0030] Here, when that message information is the message information that it does not display (i.e., when the flag "1" is set to the non-displayed flag register of the bank where the management data memory specified by the counted value of a bank counter corresponds), while resetting this flag and carrying out "-1" of the counted value of a non-displayed flag counter, Flushing of Message No and the call classification notation which are displayed on display 29j is carried out.

[0031] Moreover, when the message information displayed is message information with an error, the inverse video of the display **** specified by the error information memorized by message memory 24b corresponding to this message information will be

carried out.

[0032] A display is continued after data display until the reset switch 17 which directs the termination of a display, or the memory bank switch 20 which directs the display of the following incoming data is operated or a timer and a 2-second timer pass the deadline of for 30 seconds. Since it means finishing the display of predetermined time when a timer passes the deadline of for 30 seconds, while turning off that display, when search mode is set up, that mode setting is also turned off, and this read-out processing is ended above.

[0033] Moreover, it is in the middle of a display, and also when it is judged that the reset switch 17 was operated, according to actuation of the reset switch 17, while turning off a display, the mode setting of search mode is turned off, and read-out processing is ended.

[0034] Since it means that the memory bank switch 18 is operated 2 seconds or more continuously, and a setup of non-displayed search mode was directed when a timer passes the deadline of for 2 seconds, after setting the search mode, carrying out a renewal setup of the counted value of a bank counter of "+1" and checking that the following incoming data is a non-indicative data, the actuation from the above-mentioned data display is repeated.

[0035] Moreover, when the memory bank switch 20 is newly turned on in the middle of data display Since it is the directions to which the display of the incoming data of the following bank is urged, while resetting non-indicative-data search mode according to this the time check of a 2-second timer and a 30-second timer -- after carrying out the restart of the actuation, a renewal setup of the counted value of a bank counter of "+1" is carried out, and the incoming data which received a message before one from the following incoming data, i.e., an incoming data on display, according to the counted value is displayed.

[0036] Thus, whenever the memory bank switch 20 is operated once in the usual mode, in search mode, only a non-displayed incoming data can be chosen from RAM24, and can be displayed.

[0037] Although arrival-of-the-mail processing with the usual mode and read-out processing are shown, if it is judged that the mode selection switch 18 which directs a change-over in the mode at step A05 of above-mentioned drawing 4 was operated, subsequently to step A08 the above will progress, and will perform change-over selection processing in the mode. This mode selection processing carries out an updating setup of the counted value of the mode counter with which the RAM24 interior is equipped. A mode counter consists of quinary counters which show five mode conditions, the normal mode, a protected mode, deletion mode, print-out mode, and time-of-day adjustment mode, and by counted value "it is a protected mode at counted value "1" about the normal mode in 0" counted value "2", deletion mode is expressed with counted value "3", and it expresses time-of-day adjustment mode with print-out mode and counted value "4", respectively. Therefore, the counted value of the mode counter in the normal mode is "0", if the mode selection switch 18 is operated once there, it results [from step A05] in step A08 and mode selection processing is performed, a renewal setup of "+1" will be carried out, and the counted value of this mode counter will be set to "1." Corresponding to the counted value of this mode counter, processing according to the mode chosen at continuing step A09 is performed, and the processing from the above-mentioned step A02 is again repeated after processing.

[0038] Now, it shall be in the receiving waiting machine condition in the normal mode

which repeats and performs processing of steps A02-A05. In order to avoid the power consumption of the selective-calling receiver with a display function which has a limit in power capacity as much as possible in a display 29 at this time, as shown in drawing 5 (A), the drive of all the display objects 29a-29i is stopped. If the mode selection switch 18 is operated in such the condition, this will be judged at step A05 and, subsequently to step A08, will result. Protected mode processing which carries out a renewal setup of the counted value of the mode counter in RAM24 of "0" to "+1" at step A08, sets to "1", and is shown in drawing 6 at continuing step A09 corresponding to this counted value "1" is performed.

[0039] The time check of a 8-second counter of the CPU14 interior where "8" seconds which are the minimum time amount of a mode display as first shown in step B01 were set up is set, and it is made to start in drawing 6 . Subsequently, it is made to indicate that the mode shifted to the protected mode in the display 29 at step B02. In this case, in a display 29, as shown in drawing 5 (B), while displaying the alphabetic character of a "protected mode" on message indicator section 29a, the lighting drive of the protected mode display object 29b is carried out. Moreover, the call classification information on the newest message information memorized according to the contents of the bank counter with this on the 1st bank of management data memory 24a in RAM24 is displayed on read-out, and this is displayed on Message No and call classification display 29j like "01C."

[0040] Then, it is continuously judged at whether the deadline of was passed in the above-mentioned 8-second timer at step B03, or the reset switch 17 was operated at step B04, whether the mode selection switch 18 was operated at step B05, whether the activation switch 19 was operated at step B06, and step B07 whether the memory bank switch 20 was operated. When it is judged that it is NO also in these any, the actuation input of a switch is stood by repeating processing of return and the following steps B03-B07 to step B03.

[0041] when it is judged that the timer passed the deadline of for 8 seconds at the above-mentioned step B03, even if switch actuation in this protected mode is not performed for 8 seconds but continues the display of this protected mode more than this similarly, switch actuation should do -- it judges as what is not, and next it progresses to step B08, the contents of the mode counter reset, and reset processing of making it "0" performs. As shown in an arrow head TU from the display condition of a protected mode which also shows a display in drawing 5 (B) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0042] Moreover, also when it is judged that the reset switch 17 was operated at the above-mentioned step B04 That a protected mode should be canceled according to this reset switch 17 actuation It progresses to step B08 next like the above, the contents of the mode counter are reset, and it is referred to as "0", and as shown in an arrow head TU from the display condition of a protected mode which also shows a display in drawing 5 (B) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0043] When it is judged that the mode selection switch 18 was operated in step B05, after carrying out a renewal setup of the counted value of a mode counter of "+1" at step B09 which continues according to this switch actuation and changing into the display condition which mode transformation to deletion mode is performed and shows a display

in drawing 5 (C), this processing is ended above.

[0044] When it is judged that the memory bank switch 20 is operated at the above-mentioned step B07, after carrying out a renewal setup of the counted value of a bank counter of "+1" at step B10 subsequently, the counted value which carried out an updating setup at step B11 judges whether it is over the number of the incoming datas memorized by RAM24.

[0045] Incoming datas, such as message information which corresponds from RAM24 according to the counted value of a bank counter at step B13, are displayed on message indicator section 29a of read-out and a display 29 etc. at the same time it sets the 30-second timer which clocks the display time of message information in continuing step B12 and makes it start, when it is judged that it has not exceeded.

[0046] Then, it continues this message indicator until it is judged that the above-mentioned 30-second timer passed the deadline of at step B03 this time or it is judged that each switch was operated at steps B03-B07.

[0047] In addition, it progresses to step B12, after resulting in step B14 continuously and setting initial value "1" to a bank counter anew, when the counted value of the bank counter which carried out an updating setup at the above-mentioned step B11 is judged to be over the number of the incoming datas memorized by RAM24.

[0048] If the activation switch 19 which directs activation of processing of data protection is operated after choosing and displaying message information to operate and protect the memory bank switch 20 as mentioned above [whether the protection flag "1" is set to the bank of management data memory 24a where this is detected at step B06, progresses to step B15, and is specified with the current bank counter, and] That is, a message current on display judges whether it is the already protected message.

[0049] If it is judged that it is not set at step B15, it will progress to step B16 next. At step B16, it is judged whether the number of whether protection of the specified message information is possible and the protection flags already set as management data memory 24a of RAM24 is less than 20.

[0050] After setting the protection flag "1" of the message information which progresses subsequently to step B17 and corresponds, while setting a timer for 8 seconds and making it start at step B18 when judged [that it can protect and], "message was protected to message indicator section 29a of a display 29 as a completion display of protection at step B19."
Becoming character representation is performed. Henceforth, processing from step B03 is performed, and this completion display of protection is continued until a timer passes the deadline of for 8 seconds.

[0051] Moreover, message indicator section 29a of a display 29 is full of "protection capacity at step B21 as a protection impossible display at the same time it progresses to step B20, it sets a timer for 8 seconds too and it makes it start, when it is judged that it could not protect, namely, 20 sets of message information is already protected at the above-mentioned step B16."
Becoming character representation is performed. Henceforth, processing from step B03 is performed, and this protection impossible display is continued until a timer passes the deadline of for 8 seconds.

[0052] After progressing to step B22 and resetting a protection flag, while setting a timer for 8 seconds and making it start at step B23 when it is judged that the protection flag "1"

is set at step B15 on the other hand, "protection was removed to message indicator section 29a of a display 29 as a completion display of protection discharge at step B24." Becoming character representation is performed. This protection discharge processing is performed, when the message which originally is not in the need for protection is protected accidentally, or when it is judged at step B16 that it cannot protect, and this completion display of protection discharge continues until return and a 8 second timer pass the deadline of to step B03 or switch actuation is detected at step B07 from step B04, after starting the completion display of protection discharge at step B24.

[0053] Next, as shown in the above-mentioned step B09, the deletion mode processing after operating the mode selection switch 18 from a protected mode, carrying out an updating setup of the counted value of a mode counter, being referred to as "2" and changing to deletion mode is explained using drawing 7.

[0054] The time check of a 8-second counter of the CPU14 interior where "8" seconds which are the minimum time amount of a mode display as first shown in step C01 were set up is set, and it is made to start in drawing 7. Subsequently, it is made to indicate that the mode shifted to deletion mode in the display 29 at step C02. In this case, in a display 29, as shown in drawing 5 (C), while displaying the alphabetic character in "deletion mode" on message indicator section 29a, the lighting drive of the deletion mode display object 29c is carried out. Moreover, the call classification information on the message information memorized on the bank where management data memory 24a in RAM24 corresponds according to the contents of the bank counter with this is displayed on read-out, and this is displayed on Message No and call classification display 29j like "01C."

[0055] Then, it is continuously judged at whether the deadline of was passed in the above-mentioned 8-second timer at step C03, or the reset switch 17 was operated at step C04, whether the mode selection switch 18 was operated at step C05, whether the activation switch 19 was operated at step C06, and step C07 whether the memory bank switch 20 was operated. When it is judged that it is NO also in these any, the actuation input of a switch is stood by repeating processing of return and the following steps C03-C07 to step C03.

[0056] when it is judged that the timer passed the deadline of for 8 seconds at the above-mentioned step C03, even if switch actuation in this deletion mode is not performed for 8 seconds but continues the display in this deletion mode more than this similarly, switch actuation does -- it judges as what is not, and next it progresses to step C08, the contents of the mode counter reset, and mode reset processing of making it "0" carries out. As shown in an arrow head TU from the display condition in the deletion mode which also shows a display in drawing 5 (C) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0057] Moreover, also when it is judged that the reset switch 17 was operated at the above-mentioned step C04 That deletion mode should be canceled according to this reset switch 17 actuation It progresses to step C08 next like the above, the contents of the mode counter are reset, and it is referred to as "0", and as shown in an arrow head TU from the display condition in the deletion mode which also shows a display in drawing 5 (C) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0058] This processing is ended, after carrying out a renewal setup of the counted value of a mode counter of "+1" at step C09 which continues according to this switch actuation

and changing into the display condition which mode transformation to print-out mode is performed, and shows a display in drawing 5 (D), when it is judged that the mode selection switch 18 was operated in step C05.

[0059] When it is judged that the memory bank switch 20 is operated at the above-mentioned step C07, subsequently it judges whether the flag "1" is set to the processed flag register for the display controls in RAM24 at step C10.

[0060] Next it progresses to step C11, and since it is at the previous time and deletion of an incoming data will already have been performed when judged [having set and], while performing sorting application of the incoming data memorized by management data memory 24a of RAM24, a renewal setup of the number of data of the incoming data memorized of "-1" is carried out, and the above-mentioned processed flag register is reset and it is referred to as "0."

[0061] Moreover, when it is judged that the processed flag "1" is not set at step C10, it progresses to step C12, and a renewal setup of "+1" is carried out, and counted value of a bank counter is carried out.

[0062] The counted value of a bank counter judges whether it is over the number of the incoming datas memorized by RAM24 after processing of step C11 or step C12. Incoming datas, such as message information which corresponds from RAM24 according to the counted value of a bank counter at step C15, are displayed on message indicator section 29a of read-out and a display 29 etc. at the same time it sets the 30-second timer which clocks the display time of message information in continuing step C14 and makes it start, when it is judged that it has not exceeded.

[0063] Then, it continues this message indicator until it is judged that the above-mentioned 30-second timer passed the deadline of at step C03 this time or it is judged that each switch was operated at steps C03-C07.

[0064] In addition, it progresses to step C14, after resulting in step C16 continuously and setting initial value "1" to a bank counter anew at the above-mentioned step C13, when the counted value of the bank counter which carried out an updating setup is judged to be over the number of the incoming datas memorized by RAM24.

[0065] If the activation switch 19 which directs activation of processing of deletion is operated after choosing and displaying the message information which wants to operate and delete the memory bank switch 20 as mentioned above, this will be judged at step C06 and then it will progress to step C17. At step C17, elimination processing of the specified message information in management data memory 24a of RAM24 and message memory 24b and other corresponding data is actually performed. Then, after setting a processed flag "1", while setting a timer for 30 seconds and making it start at step C19 by step C18, "message was eliminated to message indicator section 29a of a display 29 as a completion display of deletion at step C20." Becoming character representation is performed. Henceforth, processing from step B03 is performed, and this completion display of deletion is continued until a timer passes the deadline of for 30 seconds.

[0066] Subsequently, the print-out mode processing after operating the mode selection switch 18 from deletion mode as shown in the above-mentioned step C09, carrying out an updating setup of the counted value of a mode counter, being referred to as "3" and changing to print-out mode is explained using drawing 8 . At this time, the printer 31 is certainly connected to the external terminal 30.

[0067] In drawing 8 , as first shown in step D01, a partial print mode, i.e., the print mode which prints only the message data currently displayed, is set up out of a partial print mode, a protection sentence print mode, a whole sentence print mode, and three print modes. A flag "1" is set as the initial-state flag register which it has in RAM24 with this. This initial-state flag register is for limiting the selection actuation out of [of above-mentioned three] a print mode only to the beginning which set up print-out mode. Then, the time check of a 8-second counter of the CPU14 interior is set, and it is made to start at step D02. Subsequently, it is made to indicate that the mode shifted to print-out mode in the display 29 at step D03. In this case, in a display 29, as shown in drawing 5 (D), the alphabetic character in "print-out mode" and each alphabetic character which shows three print modes, a "part", a "protection sentence", and a "whole sentence", are displayed on message indicator section 29a. In this case, since "partial printing" is initialized as a print mode, the inverse video only of the alphabetic character of a "part" shall be carried out. Moreover, the lighting drive of the 29d of the print-out mode display objects is carried out with this. Furthermore, the call classification information on the message information memorized on the bank where management data memory 24a in RAM24 corresponds according to the contents of the bank counter is displayed on read-out, and this is displayed on Message No and call classification display 29j like "01C."

[0068] Then, it is continuously judged at whether the deadline of was passed in the above-mentioned 8-second timer at step D04, or the reset switch 17 was operated at step D05, whether the mode selection switch 18 was operated at step D06, whether the print mode selecting switch 21 was operated at step D07, whether the activation switch 19 was operated at step D08, and step D09 whether the memory bank switch 20 was operated. When it is judged that it is NO also in these any, the actuation input of a switch is stood by repeating processing of return and the following steps D04-D09 to step D04.

[0069] when it is judged that the timer passed the deadline of for 8 seconds at the above-mentioned step D04, even if switch actuation in this print-out mode is not performed for 8 seconds but continues the display in this print-out mode more than this similarly, switch actuation does -- it judges as what is not, and next it progresses to step D10, the contents of the mode counter reset, and reset processing of making it "0" carries out. As shown in an arrow head TU from the display condition in the print-out mode which shows a display in drawing 5 (D) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0070] Moreover, also when it is judged that the reset switch 17 was operated at the above-mentioned step D05 That print-out mode should be canceled according to this reset switch 17 actuation It progresses to step D10 next like the above, the contents of the mode counter are reset, and it is referred to as "0", and as shown in an arrow head TU from the display condition in the print-out mode which also shows a display in drawing 5 (D) according to this, this processing is ended by return and the above in the standby condition of the normal mode of drawing 5 (A).

[0071] When it is judged that the mode selection switch 18 was operated in step C06, this processing is ended, after carrying out a renewal setup of the counted value of a mode counter of "+1" at step C11 which continues according to this switch actuation and changing into the condition which mode transformation to time-of-day adjustment mode is performed, and shows a display in drawing 5 (E).

[0072] When it is judged that the print mode selecting switch 21 is operated at the above-

mentioned step C07, it judges whether subsequently to the initial-state flag register of RAM24, the flag "1" is set at step C12.

[0073] Although print mode selecting-switch 21 actuation is made into an invalid and it returns to processing from the above-mentioned step D04 since it means that the activation switch 19 or the memory bank switch 20 was operated after the set of this flag "1" at the above-mentioned step D01 when it is judged that it is not set When it is judged that it is set, an updating setup of the counted value of a print mode counter is carried out at step D13 next. To a protection sentence print mode, the inverse video of the alphabetic character of message indicator section 29a which performs change processing of a print mode from a protection sentence print mode to a whole sentence print mode or from a whole sentence print mode to a partial print mode, and corresponds is carried out from a partial print mode.

[0074] It progresses to step D14 after that, and that predetermined time continuation should be carried out, a timer is set for 30 seconds, the display of this changed print mode is started, and it results [from the above-mentioned step D04] in processing henceforth.

[0075] If the memory bank switch 20 is operated in order to make specific message data choose and print, this will be judged at the above-mentioned step D09, and then will result in step D15. At step D15, it is judged according to the contents of the print mode counter whether a current print mode is a partial print mode.

[0076] When it is judged that it is not a partial print mode here, actuation of the above-mentioned memory bank switch 20 becomes invalid, and it returns to processing from step D04 again, but if it is judged that it is a partial print mode, while progressing to step D16 next and carrying out a renewal setup of the counted value of a bank counter of "+1" corresponding to actuation of the mode selection switch 18, the above-mentioned initial-state flag register is reset.

[0077] Subsequently, in step D17, the counted value of this bank counter that carried out an updating setup judges whether it is over the number of the incoming datas memorized by RAM24. Incoming datas, such as message information which corresponds from RAM24 according to the counted value of a bank counter at step D19, are displayed on message indicator section 29a of read-out and a display 29 etc. at the same time it sets a timer for 30 seconds and makes it start at continuing step D18, when it is judged that it has not exceeded.

[0078] Then, it continues this message indicator until it is judged that the above-mentioned 30-second timer passed the deadline of at step D04 this time or it is judged that each switch was operated at steps D04-D09.

[0079] In addition, it progresses to step D18, after resulting in step D20 continuously and setting initial value "1" to a bank counter anew at the above-mentioned step D17, when the counted value of a bank counter is judged to be over the number of the incoming datas memorized by RAM24.

[0080] And if the activation switch 19 on which activation of printing is actually directed is operated, the activation switch 19 will be judged to be ON at step D08 by this actuation input, and then it will progress to step D21. It is made to indicate "it is under the alphabetic character which shows that it is printing on message indicator section 29a of a display 29, for example, print," at step D21. Subsequently, after making a note of the value of the bank counter in the time to the internal register of CPU14 at step D23 temporarily for evacuation, it progresses to step D24 and printing processing is

performed.

[0081] Drawing 9 is a subroutine which shows the detail of this printing processing. In this drawing, it is judged whether a print mode is a partial print mode at step E01 first. When it is a partial print mode, next it progresses to step E02, and only the message data displayed at step D19 of above-mentioned drawing 8 is made to print out by the printer 31.

[0082] That is, print-out data are the existence of Message No (bank No), class-of-call information, and a non-displayed flag, the existence of a protection flag, arrival-of-the-mail time, message information, etc.

[0083] In addition, when message information is message information with an error, based on corresponding error information, the part is printed by tone reversal like the case of a display. This subroutine processing is ended above.

[0084] Moreover, when it is judged at step E01 that a print mode is not a partial print mode, it is judged at step E03 next whether it is a protection sentence print mode. When it is a protection sentence print mode, after progressing to step E04 next and newly setting initial value "1" as a bank counter here, processing after step E05 is performed.

[0085] At step E05, it judges whether the protection flag "1" is set to the bank where management data memory 24a in RAM24 corresponds according to the counted value of a bank counter. While printing out this message data etc. by the printer 31 like the above-mentioned step E02 after printing the alphabetic character which "protection message" Becomes the beginning at continuing step E06 since this message data will be a protection message when set, No of the message data under current printing, i.e., the counted value and the call classification information on message data on a bank counter, is displayed on the message No of a display 29, and call classification display 29j.

[0086] Since the message data will not be a protection message when the protection flag "1" with which it corresponds in message data at the above-mentioned step E05 is not set, processing of step E06 is not performed. Then, after carrying out a renewal setup of the counted value of a bank counter of "+1" at step E08, this counted value that carried out an updating setup judges whether the number of the incoming datas memorized by RAM24 was exceeded at step E08.

[0087] When it is judged that it has not exceeded, it returns to the above-mentioned step E05 continuously. In this way, by repeating and performing processing of steps E05-E08, the message data memorized by RAM24 is searched in order of the bank No, and that to which the protection flag is set is printed out with the display of the sequential bank No.

[0088] If the number of incoming datas which all print-out of the message data with which the protection flag is set was completed, an updating setup of a bank counter progressed, and that counted value has memorized to RAM24 is exceeded, after this will reset the counted value of the bank counter to which it is judged at step E09 and made to evacuate at step E09 finally, this subroutine is ended above.

[0089] Moreover, since a print mode will be a whole sentence print mode when it is judged at the above-mentioned step E03 that a print mode is not a protection sentence print mode, either, after progressing to step E10 next and newly setting initial value "1" as a bank counter here, processing after step E11 is performed. After printing the alphabetic character which "messages [all]" Becomes the beginning, while printing out message data etc. for read-out, this message data, etc. by the printer 31 like the above-mentioned step E02 from RAM24 according to the counted value of a bank counter, the

counted value and call classification information on a bank counter are expressed to the message No of a display 29, and call classification display 29j as step E11.

[0090] Then, after carrying out a renewal setup of the counted value of a bank counter of "+1" at step E12, this counted value that carried out an updating setup judges whether the number of the message data memorized by RAM24 was exceeded at step E13.

[0091] When it is judged that it has not exceeded, it returns to the above-mentioned step E11 continuously. In this way, by repeating and performing processing of steps E11-E13, the message data memorized by RAM24 is altogether printed out with the display of Bank No according to the order of the bank No.

[0092] All print-out of the memorized message data is completed, and if the number of data which the counted value of a bank counter has memorized to RAM24 is exceeded, after resetting the counted value of the bank counter to which this is judged at step E13 and it was made to evacuate at step E14 finally, this subroutine will be ended above.

[0093] After performing printing processing corresponding to the print mode as mentioned above, a timer is set for 30 seconds and it is made to start, as shown in step D25 of drawing 8 . And in continuing step D26, the initial message when going into the message corresponding to the bank No memorized at the above-mentioned step D23, i.e., printing processing, is displayed, a series of processings are ended, and it returns to the above-mentioned step D04.

[0094] In addition, if the mode-selection switch 18 be operate in the above-mentioned print-out mode, as show in step D11, the mode be change and it will become time-of-day adjustment mode from print-out mode, but actuation with this time-of-day adjustment mode be only adjustment processing of the present time-of-day data only clock in the clock section 23, and since **** be related, it omit that explanation and show only the display condition of a display 29 to drawing 5 (E).

[0095] Moreover, in time-of-day adjustment mode, if the mode selection switch 18 is operated, it will become the normal mode from time-of-day adjustment mode, but by the normal mode at this time, as shown in drawing 5 (F), the message of the bank chosen as message indicator section 29a of a display 29 now is displayed. This display condition is the same as the display condition at the time of the read-out processing in step A07 of drawing 4 . If the mode selection switch 18 is operated in this normal mode, as shown in drawing 5 , it will change to a protected mode.

[0096] In addition, these mode changes are possible during read-out processing of step A07, and the mode change in this case is the same as that of the change-over from the normal mode shown in drawing 5 (F).

[0097]

[Effect of the Invention] As a full account was given above, according to this invention, it corresponds to each message information memorized. When the identification information of whether to be what the message should protect is made to add and memorize and the storage capacity of memory fills While eliminating message information other than the message information which should be protected according to the above-mentioned identification information in predetermined sequence Since it was made to make it display in order of arrival of the mail including the message information from which the message information memorized by memory should be protected At the time of the check of the message information which covered the long time and important message information is not only certainly memorizable, but memorized it in memory, the

selective-calling receiver with a display function which can also check the order of reception including the protected message information can be offered.

[Translation done.]